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Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

AERONAUTICAL RECOMMENDED PRACTICE

ARP341B

NOMENCLATURE GUIDE FOR AIRCRAFT ENGINE PARTS

Issued 9-1-45
Revised 10-15-53

1. INTRODUCTION

This Nomenclature Guide has been expanded to cover gas turbine types of aircraft engines, such as the turbo-jet and the turbo-prop engines, to as complete an extent as the present state of development in this field will permit. In adding terms applicable to these engines an effort has been made to accomplish the greatest practical degree of over-all standardization. Some revision to include definitions clarifying the usage of some terms which were omitted from the original issue has also been included.

This Nomenclature Guide aims to define terms commonly used for aircraft engine parts in such a way that each can be differentiated from the other. The original investigation of the usage of these terms found much ambiguity and lack of uniformity in their meanings. Therefore, the attempt to provide a standardized Nomenclature necessarily meant that the scope of application of several of these terms had to be restricted. In some cases it was found that a few of them could be eliminated. Hence, many of the definitions in this Guide will not fit all of the possible usages of each term. They will, however, taken collectively, be found to cover the entire field of aircraft engine parts to which many of them have previously been applied.

This Guide does not pretend to give definitions which completely describe each term and list all of its usages. Such can be found in existing technical dictionaries, and, if attempted here, would require considerable length which would handicap the primary purpose of presenting the differences between each term. Hence the definitions give only sufficient characteristics of the terms so that the reader, who is assumed to be familiar with them, can see the proposed distinction.

It will be noted that some compound part names (such as crankcase, crankshaft, etc.), which are used to designate a specific part rather than a class of parts, are written as one word because of common usage, but this practice is not generally recommended.

The definitions are so arranged that similar terms or those which are likely to be confused are grouped together. The location of each group is selected by the alphabetical listing of the most general or the most common term of that group. Cross reference notes are made for all of the terms defined.

For other SAE documents relative to nomenclature and definitions see:

AS 20	Definitions, Aircraft Engine Performance
ARP 147	Nomenclature, Aircraft Air Conditioning Equipment
ARP 148	Nomenclature, Aircraft Ice Elimination Equipment
ARP 171	Nomenclature, Aircraft Oxygen Equipment
AS 134	Nomenclature - Engine Cooling Fan
ARP 355	Terminology of Dual, and Coaxial Counter-Rotating Propellers
AS 272	Definitions, Aircraft Turbine Engine Performance

Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

AERONAUTICAL STANDARD

AS 272

DEFINITIONS, AIRCRAFT ~~TURBINE~~ ENGINE PERFORMANCE

Issued 10-15-53
Revised

Standard Conditions are the values of air temperature, pressure and humidity defined by NACA Report No. 218.

TURBO JET ENGINES

1. Take - off Rated Thrust is the maximum static thrust in pounds, at sea level standard conditions, specified by the manufacturer for take-off.

2. Normal Rated Thrust is the maximum static thrust in pounds, at sea level standard conditions, specified by the manufacturer for continuous operation.

3. Take-off Rated Speed is the speed of the turbine rotor or rotors in RPM, specified by the manufacturer for take-off.

4. Normal Rated Speed is the speed of the turbine rotor or rotors in RPM, specified by the manufacturer for continuous operation.

5. Thrust Specific Fuel Consumption is the fuel flow rate expressed in pounds per hour per pound of net jet thrust.

6. Net Jet Thrust is the force in pounds due to rearward ejection of exhaust gases minus that force required to accelerate the intake air from rest to flight speed.

TURBO PROP ENGINES

1. Take-off Rated Shaft Power is the maximum propeller shaft horsepower, at static sea level standard conditions, specified by the manufacturer for take-off.

2. Normal Rated Shaft Power is the maximum propeller shaft horsepower, at static sea level standard conditions, specified by the manufacturer for continuous operation.

3. Equivalent Shaft Horsepower is the sum of the shaft horsepower and the horsepower equivalent of the jet thrust.

   NOTE: For calculating equivalent shaft horsepower at static conditions, 2.5 pounds net jet thrust is assumed to equal one horsepower. Net jet horsepower in flight is the product of the net jet thrust in pounds and true air speed in feet per second converted to horsepower and divided by the 80% propeller efficiency accepted as an industry standard.

4. Take-off Rated Jet Thrust is the maximum static net thrust at take-off rated engine speed and sea level standard conditions, specified by the manufacturer for take-off.

5. Normal Rated Jet Thrust is the maximum static net thrust at normal rated engine speed and sea level standard conditions, specified by the manufacturer for continuous operation.

6. Take-off Rated Engine Speed is the speed of the rotor or rotors specified by the manufacturer for take-off.

7. Normal Rated Engine Speed is the speed of the rotor or rotors specified by the manufacturer for continuous operation.

8. Ram Power Rating is the maximum shaft horsepower permitted by the manufacturer under any conditions.

9. Equivalent Specific Fuel Consumption is the fuel flow rate expressed in pounds per hour per equivalent shaft horsepower.

Prepared by Committee E-21, General Standards for Aircraft Engines

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Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

AERONAUTICAL RECOMMENDED PRACTICE

ARP 290

Issued 10-15-53
Revised

COCKPIT SEATS FOR COMMERCIAL TRANSPORT AIRCRAFT

1. PURPOSE: The purpose of this report is to set forth recommendations for a standardization of cockpit seats for transport aircraft (CAA Category - Type I - Transport). In the preparation of this report consideration was given to the requirements of the CAA, military specifications, and the recommendations of the airline operators and the aircraft manufacturers. It is recognized that a rigid specification is undesirable and may restrict development and utilization of initiative. For this reason this ARP is in general terms and offered as a guide.

2. DEFINITIONS:

2.1 Seat Reference Point: The term seat reference point as used in the text and figures is the line of intersection of the back and aft cushions when in the compressed state under the load of a 200 lb. man.

2.2 Scope: The recommendations as listed below shall apply to all regularly assigned flight crew members: first pilot, co-pilot, flight engineer, radio operator and navigator. Due to limitations that it would place upon basic airplane design it is not considered practical for these recommendations to apply fully to the so-called jump seat. However, it should be emphasized that every effort be made to provide the jump seat position with an equivalent level of comfort.

In drawing up the recommendations for the crew members' seats the following items should be considered at all times:

2.2.1 If the crew member is comfortable in flight he will be less susceptible to fatigue and can perform his duties in a safer and better manner.

2.2.2 It is to be considered that when the crew member is occupying his seat he is on duty. Therefore, all seat adjustments are for the purpose of fitting the seat to the different sizes and shapes of personnel in order to enable the occupant to do his work in the most efficient and comfortable manner.

X-TL1
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Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

AERONAUTICAL STANDARD AS 273

POSITION LIGHT FLASHERS: SINGLE-CIRCUIT (Personal Aircraft Types)

Issued 10-15-53
Revised

1. PURPOSE: To specify minimum requirements for aircraft position light flashers operating in a single circuit.

2. SCOPE: This specification covers three types of position light flashers:

Type I - For nominal 24 volt d.c. systems.

Type II - For nominal 12 volt d.c. systems.

Type III - For nominal 6 volt d.c. systems.

3. GENERAL REQUIREMENTS:

3.1 Materials and Workmanship:

3.1.1 Materials: Materials shall be of a quality which experience and/or tests have demonstrated to be suitable and dependable for the purpose intended.

3.1.2 Workmanship: Workmanship shall be consistent with high-grade aircraft electrical equipment practice.

3.2 Identification:

3.2.1 Nameplate: The following information shall be legibly and permanently marked on the unit or attached thereto:

(a) Name of unit (Position Light Flasher)
(b) SAE Specification AS 273
(c) Nominal operating voltage - volts.
(d) Maximum lamp load contact rating - amps.
(e) Load resistance range - ohms (where applicable, see sub-section 4.3).
(f) Manufacturer's part number.
(g) Manufacturer's serial number or date of manufacture.
(h) Manufacturer's name and/or trademark.

3.2.2 Wiring Diagram: An internal schematic wiring of the flasher shall be legibly marked on the unit or attached thereto.

3.3 Environmental Conditions:

3.3.1 Temperature: The unit shall function and not be adversely affected by operation in an ambient temperature of -20°F. to +140°F.

3.3.2 Humidity: The unit shall operate and not be adversely affected when exposed to a relative humidity up to and including 95% at a temperature of approximately 90°F.

3.3.3 Altitude: The unit shall operate and not be adversely affected when subjected to a pressure range equivalent to -1000 feet to +15000 feet standard altitude.

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AERONAUTICAL RECOMMENDED PRACTICE

ARP 260
Issued 10-15-53
Revised

CONTROL LEVER - CONNECTIONS (60° V SERRATIONS)

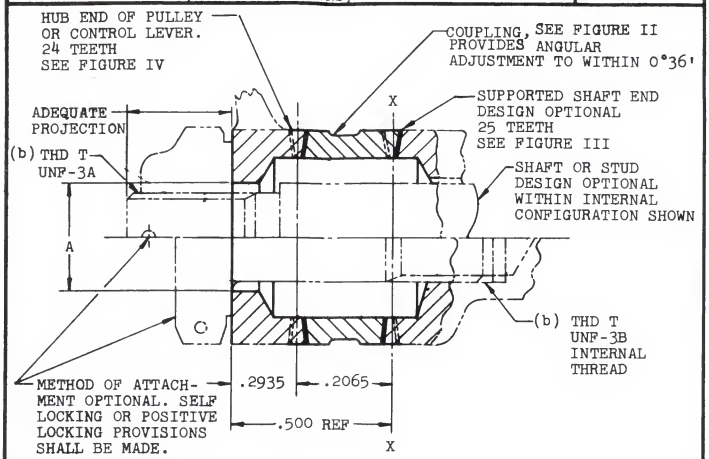

FIGURE I
INSTALLATION

NOM SIZE T		A DIA +.005 -.002	T	MAX APPLIED OVERHUNG MOMENT LB-IN.	MAX TORQUE LB-IN	MIN-MAX WRENCH TORQUE LB-IN. (a)
.250		.281	.250-28	100	750	70-85
.375		.406	.375-24	500	750	225-300
.500		.531	.500-20	1100	750	500-750

FIGURE I REPRESENTS GENERAL INSTALLATION FOR AIRCRAFT ENGINE TO AIRCRAFT CONTROLS.
NOMINAL USE: POWER LEVER, PROPELLER CONTROL, ETC.
FOR OTHER COMPLETE INTER-CONTROL APPLICATIONS, VARIATION IN DESIGN AND METHOD OF ATTACHMENT PERMITTED.
(a) MINIMUM WRENCH TORQUE REQUIRED TO PREVENT TOOTH SEPARATION UNDER COMBINED TORSION AND BENDING LOADS APPLIED ABOUT AXIS XX THROUGH LEVER OR PULLEY SIDE FORCES.
(b) REFERENCE SPECIFICATION MIL-T-7742.

SAE
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ALPHABETICAL INDEX

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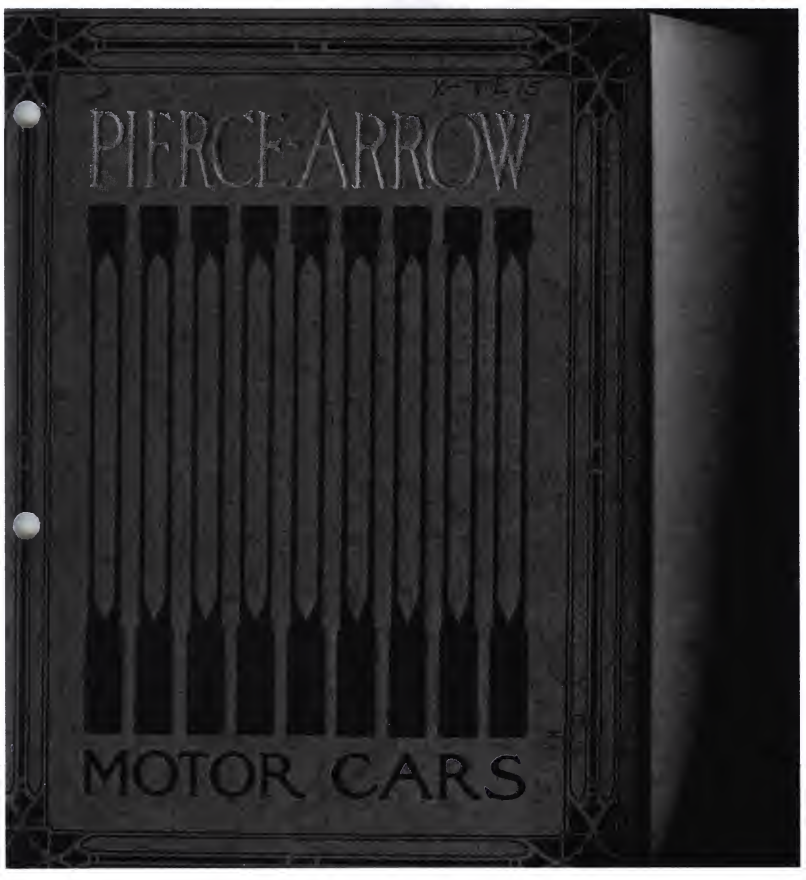
Anzugsordnung

der

Motorsportschulen des NSKK.

Das Nationalsozialistische Kraftfahr-Korps


PIERCE-ARROW
MOTOR CARS

ROCHESTER AUTOMOTIVE DIRECTORY

"THE CLUB
OF
10,000 BOOSTERS"

The
AUTOMOBILE CLUB
OF
ROCHESTER

Motor Buggy Fever

By LEON RICHARD HUTCHINSON

The true story of Charles E. Duryea, inventor of the first American gas propelled auto. Duryea had a notion that his horseless carriage would someday replace the horse and buggy as a better means of transportation—and lived to see the day when his prediction came true.

This story begins back in the horse and buggy days with the birth of Charles E. Duryea on December 15th, 1861, in the house of James Turner four miles southeast of Canton, Illinois.

During the second year of his life Charles Duryea moved with his family to Peoria where his boyhood days were spent in moving back and forth between Peoria and Canton — living a peaceful but happy life. In January 1873 the family moved to Stark County—four miles east of Wyoming; and, it was here that young Charles Duryea was first introduced to the three "R's."

Later in life in all probability Professor W. R. Sandham had more influence over young Duryea than all the rest. For it was he who introduced him to the Scientific American and layed the ground work for his mechanical thought and work to follow that meant so much to him throughout his entire lifetime.

Unbelievable as it may be Charles Duryea turned up teaching school for a year at the tender age of seventeen. He had attended Gitting's Seminary at La Harpe, Illinois. Took two three year courses in two years. In order that he might put himself through the Seminary he sawed wood and built fires for his board and room during the winter months.

While Charles was attending the Seminary Professor Sandham took notice of the fact that this lad showed unusual mechanical abilities, and, that his aptitude for debating was soon going to win him a place on the debating teams that were so popular at that time.

During the spring months he worked on the farm. Many a day he walked behind a plow and felt the good earth against his bare feet. After Professor Sandham placed him on the debating teams Duryea often walked over four miles, at night in order to participate in the debates. At one of these debating classes Duryea predicted horseless carriages in the early Seventies. Professor Sandham thought him foolish for doing so. Not long after that air navigation caught his interest. The disaster of Donaldson's balloon, which occurred in France in the early Seventies. Duryea was sure that if the bag was to make headway against a wind it would more than likely require a rigid frame.

power must be applied to the balloon; and that it must be on or near the bag and not far below as in the Reynard and Krebs test in

While working on the farm a hired man showed him how to make his first three stick kite to fly. One day when reeling it in and nearing the house with its trees this kite flew almost directly over his head. Charles guessed at the angle. He saw that the load of a plane could be much greater than the pushing power.

Around 1878 Col. Pope began to make bicycles. Pope's prices on these high-wheeled cycles were far too high for Duryea's meager earnings. So he began to build one himself. Most of his time was spent doing farm jobs during the day time, but at night he stole a few hours to work by lantern on his idea of a better high wheeled bicycle. A forty-two inch front wheel on his cycle came from a corn cultivator. The rear wheel from a boys express wagon. A curved sapling became the backbone. Oak strips were turned into forks for handlebars. At first they were twenty-eight inches long. But later they were shortened to fourteen inches to let his long legs get under them easier. A block of wood covered with old carpet made a good saddle on this first bicycle he built.

At that time the prairie roads were ridged with sod centers, so his early training as a bicycle rider was confined to the barnyard lot instead of the roadways. More than once the wheel ran away with him, threw him over a feed trough or a contented cow chewing her cude but watching the show with startled amazement. Once he saw a kitten a hundred feet ahead of him and tried to avoid hitting it but the speed of the cycle ran over the pet before he could stop it.

About this time Charles Duryea's father realized that his son needed a bicycle and bought him a fifty-two inch iron tire western toy machine for thirty-three dollars. He took it to La Harpe and cut some fancy capers on it.

Here Charles was obliged to work as a janitor and clerk in his father's store. This was pretty dull, so when an opportunity presented itself to take a job as a carpenter in Canton young Charles jumped at the chance. Luckily the Canton Mill was being refitted by St. Louis millwrights and they needed more help. This job paid Duryea two dollars a day. After completion of the work on the Mill, his fellow tradesmen were returning to St. Louis. They liked him and asked him to come along.

St. Louis was a big excitement to Duryea. Between jobs with the carpenters he obtained a second hand bicycle for eighty dollars. And when it was discovered by his friends that he could ride well they insisted that he enter a bicycle contest. At this particular contest the track was the elevated promenade behind the circular grandstand of a bowl or ampitheater. Duryea owned one suit. The coat had a long tail. With Duryea peddling faster at each half turn the small wheel lifted off the track and the breeze flew his coat tails high in the air. He became the joke of the afternoon. The crowd roared and he finished in the money. The prize Duryea won was a suit of clothes a taylor had made for a horseman.

Bicycles still intrigued him. And soon cyclists began to ride bigger wheels because they thought them faster wearing thick soled shoes. Duryea kept up with it. He used most of his wages to make and patent a new saddle for cycles. It was probably the first hammock saddle for bicycles patented in the United States. The new saddle brought him a little money. Finally deciding the carpenter trade was not for him he took a two weeks vacation and ended up in a bicycle repair shop.

Washington, D. C. He had a weeks pay due him, a twenty five dollar railroad fare and exactly sixty cents in his pocket, when he landed in the nation's capital.

That summer his father died, and his mother wrote him asking him to return and help her run the farm. The next spring he went back to the farm to help his

The Red Devil

By Edward Porter